

### REMARKS

The Office Action of October 30, 2008 has been carefully considered.

Claims 15-19 and 22 have been rejected under 35 USC 102(b) as anticipated by Delperier et al, and claim 20 has been rejected under 35 USC 103(a) over Delperier et al in view of Valentian and Carroll et al.

Claim 15 has been amended to clarify the subject matter of the invention, reciting that the substrate is gas permeable, the permeability being noted in the specification at page 3, lines 26-28, and reciting that pore channels are interspersed through the framework through which gas flows, as recited at page 4, lines 4-6.

Thus, the substrate of produced by the method of the invention is not just one with random pores distributed throughout, but a substrate through which gas flows. The substrate of the invention - also referred to as a carrier or susceptor - is meant for treating objects such as semiconductor wafers. For example, the back surface of an object can be protected during an epitaxial process prior to deposition, as long as a cleaning or purifying gas is conducted through the susceptor. Furthermore, the cleaning gas ensures that dopant atoms that escape from the back surface of the object during the epitaxial process are carried away with the gas flow, so that autodoping of the front surface of the object is substantially reduced.

According to the present disclosure, it is possible to produce a very strong susceptor in which pore channels are statistically distributed or randomly arranged and isotropically distributed throughout the fiber structure of the framework, such that gas, that is to be applied to an object to be processed and positioned onto the support substrate, flows through the pore channels. The flow through the randomly

extending pore channels causes the retention time of the gas inside the substrate to increase, producing very even heating of the gas. Furthermore, due to the plurality of pore channels, a gas flow with a very high level of homogeneity can be achieved.

Such a substrate is not disclosed or suggested by Delperier et al, which is directed to densifying a hollow porous substrate by chemical vapor infiltration (CVI). The hollow porous substrate which is produced is disclosed as being a crucible or crucible-support bowl, and in particular, the crucible is used for drawing silicon single crystals by means of the Czochralski process (see paragraph [0040]).

The bowls produced by the process of Delperier et al are intended to receive liquid silicon and are not meant to be interspersed with gas for treating an object. Since the bowls produced must be suitable for receiving liquid silicon for drawing single crystals, the material of which the bowls are formed needs to be densified to such an extent that the fluids cannot leak out. Not only do the bowls of Delperier et al not need to be gas permeable, gas permeability would cause the bowls to leak liquid silicon, and make them unsuitable for the purpose identified by Delperier et al.

The Office Action responds to Applicant's arguments by stating that only the surface in contact with the material to be contained must be densified to prevent material leakage. While this may be true, it is equally true that a surface densified to prevent material leakage, as taught by Delperier et al, would not be gas permeable. While the Office Action appears to recognize that such densified surfaces would not be gas permeable, it notes that the support mechanism protects the end caps of the bowls "which means that the endcaps of the bowls remain porous. As such, the densified bowls will have densified inner and outer surfaces with a porous structure

between the layers which is accessible to the atmosphere via the untreated endcap portions of the bowls."

This analysis is mere speculation. More likely to occur is full densification of the bowls between the endcaps, resulting in a bowl which is not at all gas permeable.

While it may be possible to carry out the Delperier et al process in such a way that porous structure remains between densified surfaces, there is no evidence that such a structure was intended by Delperier et al, and good evidence that it was not. The object of the invention of Delperier et al is to improve the densification; note paragraph [0008]:

When the substrates to be densified are hollow as defined above, having relatively deep concave portions, and in particular when they are of quite large dimensions, defects have been observed by the inventors after densification by chemical vapor infiltration. These defects consist in variations in the microstructure of the material of the matrix between different portions of the densified parts, and in the formation of soot or undesirable projections on the substrates.

From paragraph [0010], the object of the invention ...is to provide a method which does not present such drawbacks, i.e. a method that enables hollow-shaped substrates, even when of large dimensions, to be densified in a manner that is relatively uniform and free from defects.

Delperier et al sweeps the concave inside surface of the crucibles with a fraction of the admitted gas flow in order to densify *in a uniform manner* and to prevent defects.

As mentioned in the example in paragraph [0088], densification is carrier out until "completed;" there is absolutely no suggestion that densification is carried out

only until the crucible surfaces are densified.

However, even assuming *arguendo* that the interpretation of Delperier et al of the Office Action is correct, the result would still be a support in which the opposed surfaces are fully densified, and which would not be gas permeable. Such a support would therefore be unsuitable for gas treatment of an object retained on the support.

Applicant points out once again, however, that there is considerable evidence that the crucible of Delperier et al is fully densified, and without the "porous structure between the layers" alleged in the Office Action.

In summary, the bowls produced by Delperier et al are suitable for receiving liquid silicon, and are therefore dense substrates without any gas permeability.

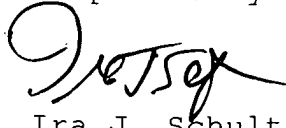
Valentian, like Delperier et al, relates to a crucible for use in a device for making single crystals. Consequently, Valentian also does not disclose a susceptor having passage openings formed by pores through which gas can flow in order to treat an object arranged on the susceptor; the crucible disclosed by Valentian must be solid to retain a liquid.

Carroll et al relates to a method of densifying porous preform having a porous interior region of graded carbon-silicon carbide. There is no disclosure or suggestion of a porous susceptor for treating objects, so the reference does not cure the defects of Delperier et al.

Withdrawal of these rejections is requested.

In view of the foregoing amendments and remarks, Applicant submits that the present application is now in condition for allowance. An early allowance of the application with amended claims is earnestly solicited.

Respectfully submitted,



Ira J. Schultz  
Registration No. 28666  
Attorney for Applicant  
(703)837-9600, ext. 23

LAW OFFICES  
DENNISON, SCHULTZ & MACDONALD  
SUITE 105  
1727 KING STREET  
ALEXANDRIA, VIRGINIA 22314-2700  
703 837-9600